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those of low intelligence to be located where their capacity would be adequate and where their character traits would make them successful. There may be many places in our business and industrial system where Fernald's case *B* would fit very well, and where an individual of a much higher intelligence might find the monotony intolerable. To refuse an occupation in business and industry to all persons with an intelligence under seventy per cent. of normal without examination of their character qualities may some time appear to be one of the greatest of human and economic wastes. In the individual of low intelligence but stable character qualities, may lie a partial remedy for the restlessness induced by extreme specialization and automaticity of work.

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THE WORD INTEGRATION AND A FEW REMARKS ON THE PALEONTOLOGY OF WORDS

TWO correspondents, Professors Wilmon H. Sheldon of Yale University, and W. A. Merrill of the University of California, have written me that "integration" has nothing to do with *gradior*, as I assumed it to have in my article "The Need of a New English Word to Express Relation in Living Nature." (This JOURNAL, August 18, 1921.) And since Merrill is a Latinist by profession, there seems nothing for me to do but to admit that at least I was "wrongly advised" as he considerably puts it. What makes the error the more troublesome to me is the fact that I do not remember the source of my advice, nor, so far, am I able to relocate it.

Professor Merrill also informs me that while the Latin *ferre* sometimes means, as I stated, bearing in the sense of producing, the producing is not the kind I meant. It never means producing in the sense of biological reproducing, I understand him to mean. It appears, consequently, that the etymological part of my effort to justify conferentiation as the new word of which our language is in need, was quite unfortunate.

It is, however, a satisfaction to be told by Professor Merrill that he sees no objection to the word I propose if I think it is needed; for, he says, "The etymology is of no importance, as no one thinks of an automobile as a self-mover."

Perhaps, then, I ought to be sorry that in this instance I did not follow, as according to my rule I should have done, the familiar advice Mr. Lincoln is said to have given in a lecture to law students: Never try to prove anything you do not have to, because you may thereby be driven into trying to prove something you can't.

But there is an aspect of the use of words which goes much deeper

than the question of the appropriateness of old words adapted to new needs. That is the question of the origin of new words. Their origin I mean, not in the linguistic sense, but in the psycho-biological sense; the sense, to wit, of the mental and physical needs to which the words correspond.

The word integration illustrates the point as well as any other. In defining this word the dictionaries note, of course, its relation to *integrare* and then to *integer*. And the verb *integrate*, it is usually mentioned, is related to the past participle *integratus*. *Integer* means whole or undivided, in the sense of being untouched or unhurt. And *integrare* means to renew or restore; and the participle *integratus* means renewed or restored.

Now in order that a thing may be untouched or unhurt, somebody or something which might touch or hurt the thing is clearly implied. A toucher or hurter is somewhere near by. Likewise a restoration necessarily implies somebody or something to do the restoring. The point is that integration relates to something being done, to an action—it implies a doer, an actor.

This reasoning is, I suppose, about the same that a philologist is likely to use in treating of the nature of words. But here comes in a consideration which, though of great interest to the student of human psycho-biology, does not, so far as I know, appeal greatly to philologists or at least to linguists. I refer to the usefulness of words in the sense of biological adaptation.

So far as I have noticed, when the linguist speaks of the use of words he has in mind the way they are put together to make spoken and written language, it being taken for granted that language is the human way of expressing ideas, feelings, *etc.* But to the modern biological naturalist, that is to say the naturalist whose hold upon the present-day conception of the nature and origin of the living world reaches clear through and all around the conception, words are among the innumerable agencies devised by the human creature to aid him in his stupendous task of maintaining himself upon the earth in progress and happiness. Words, and especially written words, are vital utilities to man, just as nests are vital utilities to birds. But just wherein is this utility of words—the original and primeval utility, I mean? In enabling men the more securely and clearly to fix in their minds, and the more easily to communicate with one another, the ideas engendered in their minds through their experiences with nature round about them. Viewed thus the verbal remains of extinct languages are as revelatory of the remote past of the human mind as the skeletal remains of extinct races and species are of the remote past of the human body.

Now as to the facts of nature upon which rest the ideas expressed

by the word integer and its kindred. It is the verbal forms, *integrare* and *integrate*, that are specially interesting from the standpoint of what I wrote about in my article.

Everybody knows to some extent, but only the naturalist knows systematically and profoundly, that there are two very distinct ways in which things are restored or made whole, these depending upon who or what the restorer or whole-maker is, and upon how the job is done. One of these ways is that of man working with his hands under the guidance of his mind; the other is that of nature working with the innumerable means at its disposal.

I have tried in another place (*The Probable Infinity of Nature and Life*, p. 33) to bring out this distinction between the creations of nature and art, in substance as follows: The human being has two ways of creating things. One way is by the use of its hands and brain. The other is by the use of its generative organs. The first way produces statues and paintings of other human beings. The second produces real other such beings. And by no possibility can the one way be substituted for the other.

Men restore automobile tires by half-soling them; and they make whole pumps and houses by manufacturing the parts and then assembling these and putting them together properly. Nature restores the humidity of the atmosphere by bringing into it in a finely divided state, water from the sea; and she makes whole crystals of salt in saturated solutions. But restoration and whole-making by these methods are far from all the methods by which restorations and whole-makings are accomplished. For nature restores worn muscles and brains by the assimilation of nourishment, and it restores branches of trees and tails of lizards when these have been lost by accident or otherwise. Further she makes whole new oaks out of acorns and whole new roosters out of hens' eggs.

These last-mentioned ways of restoring and whole-making biological naturalists have studied deeply and broadly, especially during late decades. And beyond question one of the most important results of their studies has been to make more definite and penetrating than before man's perception of the difference between living nature's way of restoring and whole-making and, on the one hand, not-living nature's way of doing these things, and on the other hand, man's way of doing them.

It is, apparently, just because we moderns have perceived these differences so much more clearly than the peoples from whom we have largely adopted and adapted our language perceived them, that we find involved there an idea requiring for its expression some such newly adapted word as *conferentiation*.

Professor Merrill makes a remark in his letter which indicates,

I believe, not only how far our predecessors had gone toward such perception, but also how much they fell short of the distance later generations have gone in the same direction. "The thought is common in ancient philosophy," he writes, "of breaking up the whole into parts and recombining them into something else—also whole, but a new one. Thus Lucretius (iii, 847) says that if the matter of our bodies were to be recollected again it would mean nothing because the chain of consciousness would be broken."

From the passage of *The Nature of Things* here referred to, and from others that could be pointed out, it seems to me clear that while Lucretius perceived distinctly enough the uniqueness of living bodies as contrasted with the elements of which they are composed, he perceived very dimly if at all the essentially transformative processes involved in organic genesis. Lucretius was, I think, far behind Aristotle in this. But even Aristotle knew, of course, only in the most crude and general way, the commonplace facts with us moderns of metabolism, growth, and development.

If Professor Merrill is right, as I do not doubt he is, in saying that *ferre* has no reference to production in the sense of organic genesis, then even differentiation is really outside the pale of living nature so far as etymology is concerned. "Arguing from the Latin directly," he says, "I should say that differentiate means to take apart . . . with an accessory notion of 'carrying away.'" According to this the actor, the taker-apart, would seem to be man acting with hands and brain. It would be man in his rôle as artist or artisan. And only by adaptive modification could the word be made to express the *diversification* which characterizes organic development. However, differentiation has been used and the use has become universal, in the terminology of organic genesis. By adaptive modification it has become thoroughly naturalized in the realm of living things. To this there is not, as I understand, the slightest objection.

By parallel reasoning conferentiation could be naturalized in the same realm to express the *unification* which characterizes organic development. And the biological importance of providing differentiation with its natural organic mate, is that the effort which has been widely made of late to pair differentiation off with integration is resulting in ideas that are not only confused but are genuinely harmful, owing to the fact that integration is already bound to disintegration as its natural inorganic mate.

One practical consequence of the general employment of integration in this inconsistent and inorganic sense, I tried to bring out in my essay. That consequence is the deterring effect such use has upon perceiving the real nature of the action of bodies or of parts

of bodies on one another in order to make the resultant new body truly organic or living. This action is so deeply reciprocal that (quoting) "while producing determinative change in [each of] the bodies, at the same time [it] leaves the individuality of these not only identifiable and unimpaired, but even improved relative to their former states." The sentence from which this is quoted begins "It is that relational action in living bodies which, while producing" *etc.* (as above).

It now seems to me that instead of conceiving this "relational action" as operating "*in living bodies*," as though it were merely an incident to such bodies, we must conceive it to be of the very deepest nature of these bodies. Except for this peculiar reciprocal action apparently no body could possess any of the attributes of life.

I wish now to invite attention to another injurious effect almost sure to result from a general use of integration as the linguistic mate of differentiation. Since integration has long been generally accepted as the antithetic mate of disintegration, the common utilization of it in the terminology of human affairs would almost inevitably tend to set it in opposition to differentiation in the sense of inhibiting it. Or, otherwise stated, since all differentiation involves change, the tendency would be to make the principle of integration act as an inhibitor of any change. With the conservative type of mind, the idea of integration could easily become a new and powerful brake upon the wheels of human progress, since it would be the most natural thing in the world for such minds to believe any change whatever that did not chance to be to their personal liking, to portend disintegration rather than progress.

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BOOK REVIEWS

Russian Dissenters. FREDERICK C. CONYBEARE. Cambridge: Harvard University Press. 1921. Pp. 370.

Perhaps no group of Christian believers are more deserving of study for their psychology and their rites than are the Russian dissenters. Few indeed are the religions of Western Europe or America that are as picturesque or as removed from the common thought of the world. Yet it may be added that few considerable numbers of Christians have ever received less attention at home or abroad. Hitherto in English the chief source has been the descriptive account of them in M. Leroy-Beaulieu's *Empire of the Tsars and Russians*, and for this reason we welcome the closely historical treatment of Professor Conybeare.